Metastatic Carcinoma of the Heart Simulating Bacterial Endocarditis

ROBERT A. RABENS, *M.D.*,
JOHN E. CANNON, *M.D.*, and
DONALD J. REHBOCK, *M.D.*, Lynwood

WITH THE RECENTLY renewed interest in the diagnosis and in the pathologic changes of neoplastic involvement of the heart it seems of value to review a case in which unusual features necessitated differentiation from bacterial endocarditis. It is well known that one or all of the usual signs of bacterial endocarditis—namely, fever, heart murmur, growth of pathogenic organisms on blood culture and embolic phenomena—are sometimes absent. Conversely, one or several of these symptoms or symptoms like them are sometimes brought about by divers diseases not primarily related to the heart. The following is a case presentation in which the diagnosis of, at least a superimposed, endocarditis was entertained because of fever, cardiac murmurs and enlargement, weakness and pallor. It was decided to treat this suspected, and possibly reversible infection despite the knowledge of the neoplastic background.

REPORT OF A CASE

A 63-year-old white woman was admitted to the hospital in February, 1955, with a painful swelling of the right leg. She had had subtotal hysterectomy in 1940 for "childbirth tears" and cholecystectomy for chronic cholecystitis and cholelithiasis in 1951. At the time of the latter operation, a diagnosis was made of squamous cell carcinoma, grade II, stage 1, of the cervical stump. Radium implants were placed and the lesion regressed. The patient remained well until December, 1954, when she noticed a dry, hacking cough and a slight elevation of temperature. A month later, ascending thrombophlebitis of the right leg necessitated hospitalization. Anticoagulants and Aureomycin were given and the patient was kept in bed with the affected leg elevated. The pain and swelling of the leg disappeared but the cough and the temperature elevation (to 101°F.) persisted. The patient had episodes of precordial distress, palpitation and sweating about the face. Digitalization was carried out and penicillin was administered parenterally in doses of 600,000 units daily. On March 16, 1955, the patient was readmitted with weakness, fever and generalized malaise. She was observed to be pale and weak. A few inspiratory rales were heard at the base of the lungs on both sides. The blood pressure was 118/80 mm. of mercury, the pulse rate 120 and respirations from 26 to 30 per minute. Upon examination of the heart it was noted that there was a predominant sinus rhythm with runs of irregular beats (auricular fibrillation) and a diastolic gallop. The heart was enlarged to the left and for the first time a grade II to-and-fro, coarse murmur was heard along the upper left sternal border. One examiner remarked upon the superficiality and varying intensity of this sound. Except for grade I pitting edema of both legs and residual effect of phlebitis on the right, no other abnormalities were noted.

The hemoglobin content was 9.5 gm. per 100 cc. of blood. Erythrocytes numbered 3.4 million per cu. mm. and leukocytes 10,200 per cu. mm.—83 per cent segmented and 3 per cent banded forms, 2 per cent eosinophils, 8 per cent lymphocytes and 7 per cent monocytes. Three cultures of blood on the initial and three on the second admission were negative for bacterial growth. The result of a serologic test for syphilis was negative. The specific gravity of the urine was 1.014. There was no reaction to tests for albumin and sugar. Upon microscopic examination of the urine a few erythrocytes and leukocytes were seen, as well as fine and coarse granular casts. An electrocardiogram showed right bundle branch block and auricular fibrillation with a moderately rapid rate.

A roentgenogram of the chest on first admission (February 1955) showed a circumscribed density in the right lower lung field and cardiac enlargement. A film taken on the second admission (March 1955) showed a definite increase in the size of the area of density, a new, smaller nodule in the right midlung field and definite increase in the size of the cardiac shadow.

A provisional diagnosis of bacterial endocarditis was made and the patient was given penicillin, 20 million units a day intravenously, and streptomycin, 1 gm. twice a day by intramuscular injection. The treatment was continued for 16 days. The patient then was afebrile but her condition continued to deteriorate and she finally died on April 5, 1955.

From the departments of medicine and pathology of the St. Francis Hospital, Lynwood.

Submitted July 13, 1956.

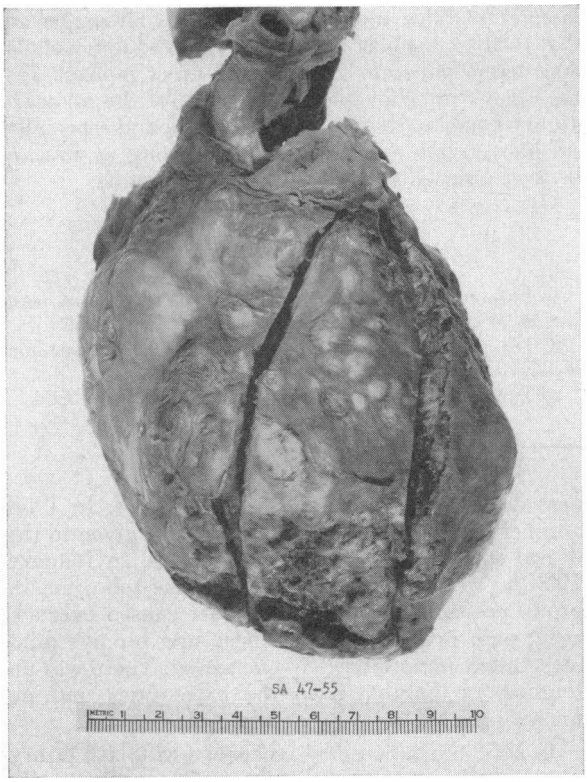

Figure 1.—Anterior surface of the heart showing numerous tumor nodules and fibrinous pericarditis.

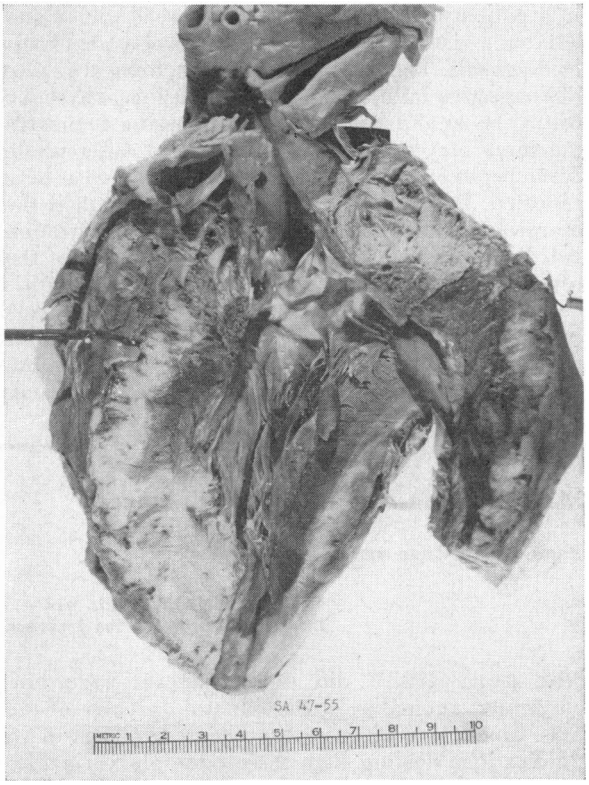

Figure 2.—Left ventricle opened to illustrate massive neoplastic involvement of the myocardium. The aortic valve (superiorly) is uninvolved.

At autopsy the heart weighed 710 grams. It was massively involved by metastatic tumor. The anterior pericardium was infiltrated with tumor and adherent to the anterior surface of the heart (see Figure 1). Scattered tumor nodules bulged beneath the epicardium of the ventricles, and there was extensive subepicardial infiltration at the base. The anterior wall of the right ventricle was largely replaced by tumor measuring as much as 3 cm. in thickness. The tumor extended continuously from the epicardial surface through to the columnae carneae and papillary muscles. A rough tumor surface replaced the endocardium in many areas. There was less extensive infiltration of the interventricular septum and left ventricle. The tumor tissue was firm, pale gray and friable. The aortic valve (as well as the other valves) was free of any involvement (Figure 2).

Scattered within the parenchyma of both lungs were nodules measuring up to 1.5 cm. in diameter. One lobulated tumor 2 cm. in diameter involved a small bronchus in the right lung. A tumor 3 cm. across was present in the dome of the right diaphragm. The peribronchial, bifurcation and paratracheal lymph nodes were involved by tumor. No tumor could be identified in the uterine cervical stump, in the liver or elsewhere below the diaphragm. Other lesions of note were recent ischemic infarcts of the spleen and left kidney, pulmonary hyperemia and edema with acute fibrinous pleurisy.

Microscopically the tumor in all situations was a partially differentiated squamous cell carcinoma.

Whether the malignant disease in this case arose from a primary carcinoma of bronchus or the previous carcinoma of the uterine cervix could not be determined, but in view of the time interval and the absence of abdominal or pelvic tumor, bronchogenic origin seemed more probable.

Metastatic tumors of the heart occur by contiguous or (rarely) lymphatic spread from adjacent or neighboring primary malignant tumors or via the blood stream. The most common primary tumors are those involving the trachea, breast, lung, esophagus, stomach, skin, kidney and pancreas.[3] The two sites of tumors that involve the heart that are diagnosed most frequently clinically are the skin (malignant melanoma) and the bronchus. Burnett and Shimkin[1] pointed out that the reported incidence of secondary neoplasms of the heart observed at autopsy of patients with cancer was from 1 per cent to 11 per cent. They reported an incidence of 18 per cent in 288 such cases and attributed the higher rate to increased awareness of the lesion and the increase in length of life in those afflicted by cancer. Diligence of microscopic search is, of course, a factor.

Most metastatic lesions of the heart cause no symptoms clinically until rather abrupt appearance of progressive signs and symptoms of cardiac disease

in a patient with evidence of widespread tumor and without a history of previous heart involvement leads to diagnosis. The most frequent symptoms are those of congestive failure, pericardial effusions, rhythmic disturbances and syncope.[2] Soft, changing or bizarre murmurs may be extremely difficult to differentiate from pericardial friction rubs, as in the case here reported. Differentiation is especially difficult if the more characteristic "scratching" quality of friction rub is absent and if the rub is louder in one of the several areas of auscultation. Bacterial endocarditis could not be excluded from consideration merely because a culture of blood does not grow organisms or because of the absence of signs of embolization. The history of cervical cancer, the presence of pulmonary nodules and thrombophlebitis all suggested that recurrent cancer was present but did not exclude concurrent valvular infection. Of great interest was the almost unbelievable replacement of the myocardium by tumor. How cardiac function, and especially cardiac output, was maintained as long as it was, even at reduced levels is difficult to imagine.

3633 Century Boulevard, Lynwood (Rabens).

REFERENCES

1. Burnett, R. C., and Shimkin, M. B.: Secondary neoplasms of the heart, Arch. Int. Med., 93:2, Feb. 1954.

2. Luisada, A. A.: Heart, Ed. 2, Baltimore, Williams and Wilkins Co., 1954.

3. Tumors of the heart, Cancer Bull., 6:112, Sept. 1954.

Malformation of the Odontoid Process

Report of a Case and Clinical Survey

FRANCIS SCHILLER, *M.D.*, and ISAMU NIEDA, *M.D.*, San Francisco

NOT UNTIL 1933[10] did reports appear regarding congenital anomalies of the odontoid process of the axis. Since then, 20 cases have been described in 15 publications dealing with three odontoid variants:

1. Complete absence (agenesis or aplasia dentis epistrophei[3,4,6,7,8,9,10,12,13,14,15]).

2. Partial absence (hypoplasia[5,8,11]).

3. Separation or nonfusion of the tip (os odontoideum[1,2,8,11]).

Associated regional malformations have occasionally been observed.[6,9,13] All three variants or degrees of abnormal odontoid growth lead to an unstable atlanto-axial joint with potential repercussion on the medulla oblongata and upper cervical cord. Following is a report of a case of absence of the odontoid process.

REPORT OF A CASE

The patient, an intelligent, physically very active 33-year-old electrician, father of three children, asked for radiologic examination of the odontoid process in July, 1956. He had been told elsewhere that this bone of the spine was either fractured or absent. Films taken previously were at that time on deposit with a court of law.

In 1944 the patient had begun to have pain in the hips. A diagnosis of rheumatoid arthritis was made in an Army hospital, and fever therapy and salicylates were given. In 1946 pain developed also in the back and chest and became so severe at one time that the patient could not get out of bed unaided. In 1948 roentgen therapy was given to the dorsal spine in a Veterans Administration hospital. Pain was relieved for one year. Then pain and stiffness developed in the neck and shoulders. In 1950 another course of roentgen therapy was given to the dorsal spine with less favorable results. In January 1956 he was thrown off a fast moving toboggan in prone position. The violent impact caused excruciating pain in the back and chest, and for five minutes he felt immobilized by the agony. There was no tingling or numbness in the extremities and no nuchal pain. There were no after effects.

In 1953 the patient had received a whiplash injury of the neck in an automobile accident. There was no immediate pain, but a few hours later the neck was stiff and so painful that he had to splint it with his hands. In routine roentgenograms of the cervical spine at that time (without views through the mouth) no abnormality was noted. Within six days the patient was back at work. In connection with court action instituted by the patient, a roentgen study had been made a short time before he sought the roentgen examination mentioned at the beginning of this report. The films, which were held as exhibits by the court were said to show that the odontoid process was missing.

In coming to the authors, the patient sought advice rather than treatment. Two physicians had told him that he needed operative fusion of the first and second cervical vertebrae, since any trivial injury, even a cough or sneeze, might cause serious, possibly fatal damage to the medulla. He also wanted to know whether he had been born without the odontoid process or it had been fractured and absorbed.

Upon examination the patient was observed to be muscular and in good general mental and physical health. All the movements of the neck were slightly limited. The dorsal and lumbar spine was practically fixed in mild lordosis; the patient stooped entirely from the hips. The remaining joints—at the time free from pain—were fully mobile. Results of neurological examination were within normal limits.

Roentgenograms of the cervical spine showed absence of the odontoid process on the appropriate views (Figure 1). With flexion and extension of the head there was abnormal mobility of the body

From the Permanente Medical Group, Kaiser Foundation Hospital, San Francisco 15.

Submitted October 17, 1956.